

CLAIMS

We claim:

1. A park brake mechanism for braking a drive line  
5 that transmits power to the wheels of a motor vehicle,  
comprising:

a transfer case having an input, and an output  
adapted for a drive connection to at least one wheel;

10 an epicyclic gearset driveably connected to the  
input and the output, adapted to produce alternately a  
high range of output speed and a low range of output  
speed;

15 a coupler including a selector moveable alternately  
between a first position where the gearset produces the  
high range, and a second position where the gearset  
produces the low range;

20 a park gear driveably connected to the input; and  
a pawl supported for releasable engagement with the  
park gear and preventing rotation of the park gear due to  
such engagement.

2. The mechanism of claim 1, wherein the transfer  
case has a first opening, and further comprising:

25 a multiple speed transmission including a  
transmission case having a second opening aligned with  
the first opening, and a transmission output driveably  
connected to the input through the first and second  
openings.

30 3. The mechanism of claim 1, further comprising:

a gear selector moveable among positions  
representing operating ranges of the transmission, the  
positions including a park position; and

35 a connector attached to the gear selector and the  
pawl, adapted to transmit movement of the gear selector  
to the pawl, the pawl engaging the park gear and

preventing rotation of the park gear in response to movement of the gear selector to the park position.

4. The mechanism of claim 1, further comprising:

- 5 a gear selector moveable among positions representing operating ranges of the transmission, the positions including a park position;
  - a connector attached to the gear selector and the pawl, adapted to transmit movement of the gear selector
  - 10 to the pawl, the pawl engaging the park gear and preventing rotation of the park gear in response to movement of the gear selector to the park position, the connector further including a detent lever connected to the gear selector supported for displacement in response
  - 15 to movement of the gear selector; and
  - a park rod connected to the detent lever for movement therewith, including a cam for forcing the pawl into engagement with the park gear when the gear selector is in the park position and allowing disengagement of the
  - 20 pawl from the park gear.

5. The drive mechanism of claim 4, wherein:

the park gear further comprises teeth distributed around a periphery of the park gear, each tooth having a crown and a radial face, and having a space between each tooth; and

the pawl further comprises a projection adapted to enter a space and to engage a radial face of a tooth on the park gear.

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6. The drive mechanism of claim 5, further comprising:

an abutment having a surface for guiding the cam toward the pawl; and

35 a ratchet spring carried on the park rod, biasing the cam toward the pawl, and permitting retraction of the

cam from the pawl in opposition to movement of the park rod toward the pawl due to contact of the projection and the crown of a tooth on the park gear.

5        7. A park mechanism for braking the wheels of a motor vehicle, comprising:

      a transfer case fixed against rotation, including a power input and an output adapted for a drive connection to at least one wheel;

10        an epicyclic gearset driveably connected to the input and the output, adapted to produce alternately a high range of output speed and a low range of output speed;

15        a coupler continually driveably connected to a first component of the gearset, and adapted for alternate drive connections to a second component of the gearset and to the transfer case, including a selector moveable alternately between a first position where the gearset produces the high range, and a second position where the

20        gearset produces the low range;

      a park gear driveably connected to the input; and

      a pawl supported for releasable engagement with the park gear and preventing rotation of the park gear due to such engagement.

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      8. The park mechanism of claim 7, wherein the transfer case has a first opening, and further comprising:

30        a multiple speed transmission including a transmission case having a second opening aligned with the first opening, and a transmission output driveably connected to the input through the first and second openings.

35        9. The park mechanism of claim 7, further comprising:

a gear selector moveable among positions representing operating ranges of the transmission, the positions including a park position; and

5 a connector attached to the gear selector and the pawl, adapted to transmit movement of the gear selector to the pawl, the pawl engaging the park gear and preventing rotation of the park gear in response to movement of the gear selector to the park position.

10 10. The park mechanism of claim 7, further comprising:

a gear selector moveable among positions representing operating ranges of the transmission, the positions including a park position;

15 a multiple speed transmission including a transmission case, the park gear being located in the transmission case;

20 a connector attached to the gear selector and the pawl, adapted to transmit movement of the gear selector to the pawl, the pawl engaging the park gear and preventing rotation of the park gear in response to movement of the gear selector to the park position, the connector further including a detent lever connected to the gear selector, supported on the transmission case for 25 rotary movement in response to movement of the gear selector; and

30 a park rod connected to the detent lever for movement therewith, including a cam for forcing the pawl into engagement with the park gear when the gear selector is in the park position and allowing disengagement of the pawl from the park gear whereby the output is free to rotate.

11. The park mechanism of claim 10, wherein:

35 the park gear further comprises teeth distributed around a periphery of the park gear, each tooth having a

crown and a radial face, and having a space between each tooth; and

the pawl further comprises a projection adapted to enter a space and to engage a radial face of a tooth on  
5 the park gear.

12. The park mechanism of claim 11, further comprising:

an abutment fixed to the transmission case, having a  
10 surface for guiding the cam toward the pawl; and

a ratchet spring carried on the park rod, biasing the cam toward the pawl, and permitting retraction of the cam from the pawl in opposition to movement of the park rod toward the pawl due to contact of the projection and  
15 the crown of a tooth on the park gear.

a park gear driveably connected to the input;

a gear selector moveable among positions including a park position; and

20 a pawl supported for releasable engagement with the park gear and preventing rotation of the park gear due to such engagement.

13. An integrated transfer case and transmission assembly for transmitting power to the wheels of a motor vehicle and for braking the vehicle, comprising:

transfer case fixed against rotation, having a first opening, including an input;

30 a transmission including a transmission case secured to the transfer case, having a second opening aligned with the first opening, including a transmission output driveably connected to the input through the first and second openings;

an output;

a sun gear driveably connected to the input;

35 a carrier driveably connected to the output;

a ring gear;

a set of planet pinions rotatably supporting on the carrier in meshing engagement with the sun gear and ring gear;

5       a coupler driveably connected to the ring gear,  
including a selector moveable alternately between a first position where the coupler completes a drive connection between the transfer case and ring gear, and a second position where the coupler mutually driveably connects the ring gear and one of the group consisting of the sun gear and carrier;

10      a park gear driveably connected to the input; and  
a pawl supported for releasable engagement with the park gear and preventing rotation of the park gear due to such engagement.

15      14. The assembly of claim 13, further comprising:

      a gear selector moveable among positions representing operating ranges of the transmission, the positions including a park position; and

20      a connector attached to the gear selector and the pawl, adapted to transmit movement of the gear selector to the pawl, the pawl engaging the park gear and preventing rotation of the park gear in response to movement of the gear selector to the park position.

25      15. The assembly of claim 13, wherein the connector further comprises;

      a detent lever connected to the gear selector, supported on the transmission case for rotary movement in response to movement of the gear selector; and

30      a park rod connected to the detent lever for movement therewith, including a cam for forcing the pawl into engagement with the park gear when the gear selector is in the park position and allowing disengagement of the pawl from the park gear whereby the output is free to rotate.

16. The assembly of claim 15, wherein:  
the park gear further comprises teeth distributed  
around a periphery of the park gear, each tooth having a  
5 crown and a radial face, and having a space between each  
tooth; and

the pawl further comprises a projection adapted to  
enter a space and to engage a radial face of a tooth on  
the park gear.

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17. The assembly of claim 16, further comprising:  
an abutment fixed to the transmission case, having a  
surface for guiding the cam toward the pawl; and  
a ratchet spring carried on the park rod, biasing  
15 the cam toward the pawl, and permitting retraction of the  
cam from the pawl in opposition to movement of the park  
rod toward the pawl due to contact of the projection and  
the crown of a tooth on the park gear.

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